Fig. 1

101
User Terminal Device
Makes a Request for
Authored Content

103
Request Sent to
Origin Server and to
Terminal Device
Detector

105
Terminal Device
Detector Identifies
User Terminal Device
from Request

107
Device Profiles
Provides User Display
Feature Values to DVI
Transformer

109
Origin Server Provides
Device-Independent
Content to DVI
Transformer

111
DVI Transformer
Removes Markup from
Device-Independent
Content

113
Device-Specific
Content Provided to
User Terminal Device

Fig. 2

121 Ascertain Feature-
Values Set of Generic
Terminal Device

123 Identify Content
Requiring Author
Annotation

125 Embed Meta-Data into
Content Requiring
Author Annotation

127 Add DVIML Markup
Using an Editor

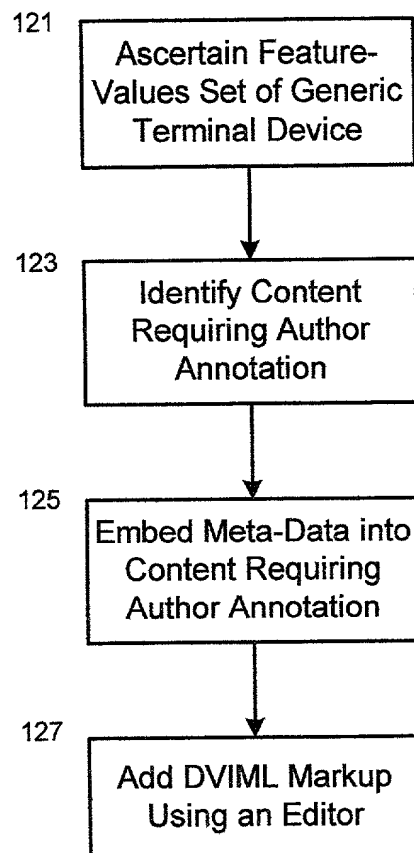**Fig. 3**

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE dviml PUBLIC "-//DVIML//DTD DVIML 0.1//EN"
"http://nda.nokia.com/DTD/dviml0.1.xml">
<dviml version="0.10">
      Giant Deep-Sea Creature
      <area concat="true">
          <segment char="200" >
          Amazes Spanish Scientists
        </segment>
       <segment char="200">
          Friday November 3 4:35 PM ET   MADRID (Reuters) <br/>
        <segment>
        <segment char="50">
          Fishermen off northern Spain have captured a giant
          specimen of a strange, light-emitting, deep sea
          cephalopod, scientists said Friday.
        </segment>
        <segment char="100">
          The octopus-like creature, a taningia danae, weighs in
          at 275 pounds, measures seven feet and is easily the
          biggest of its type discovered.  Disappointingly for big
          eaters near the Asturian port of Ribadesella it will not
          end up on their plates, but will be  preserved and
          displayed in a marine center whose most impressive
          cephalopod to date was a mere 140 pound example.
        </segment>
      </area>
      <area concat="false">
          <segment char="50">
          picture50
        </segment>
        <segment char="200">
        picture200
        </segment>
      </area>
</dviml>
```
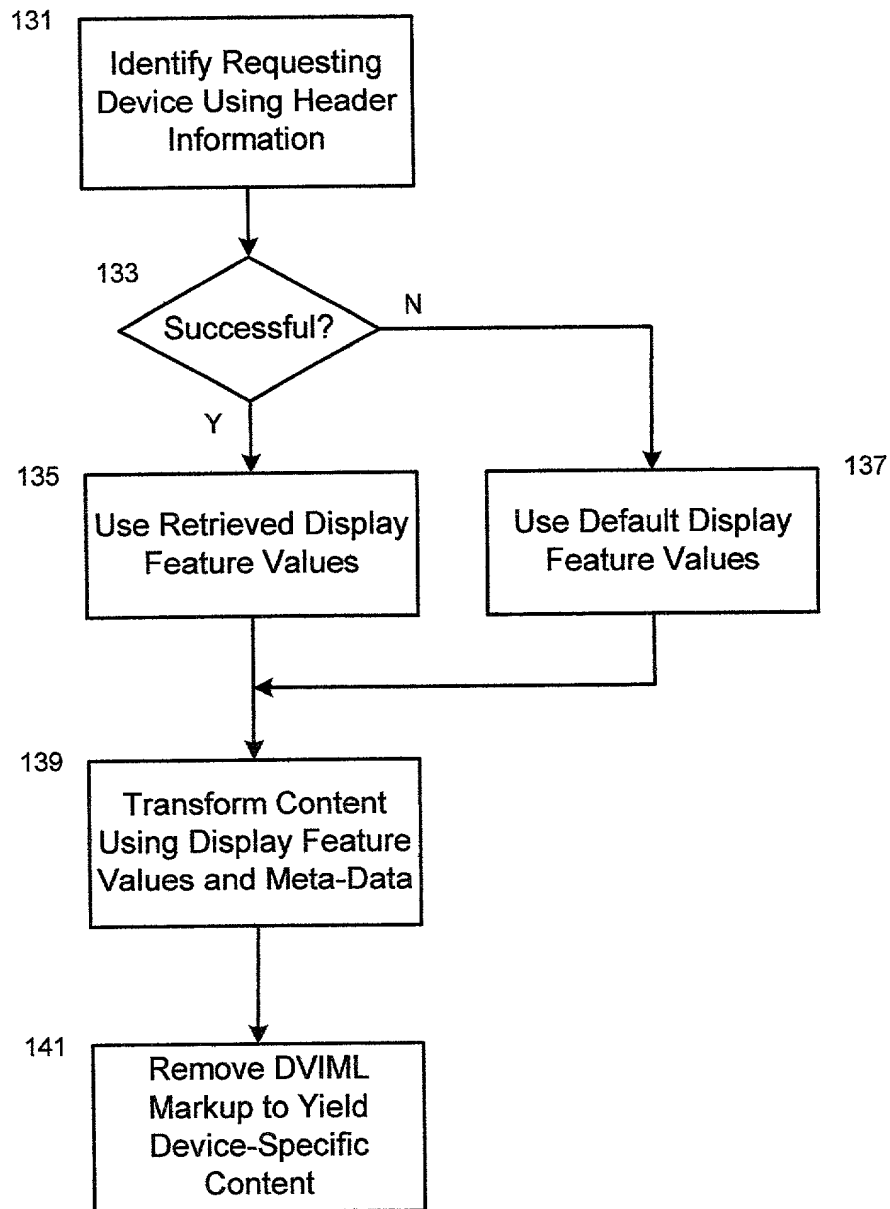
Fig. 4

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131
Identify Requesting
Device Using Header
Information

133
Successful?

N

Y

135
Use Retrieved Display
Feature Values

137
Use Default Display
Feature Values

139
Transform Content
Using Display Feature
Values and Meta-Data

141
Remove DVIML
Markup to Yield
Device-Specific
Content

Fig. 5

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.2.xml">
<wml xmlns:nda="http://nda.nokia.com/deviceAdapter">
  <card>
    <p>
      Giant Deep-Sea Creature
      <nda:area nda:concat="true">
        <nda:segment nda:char="200" >
          Amazes Spanish Scientists
        </nda:segment>
      </nda:area>
    </p>
    <p>
      <nda:area nda:concat="true">
        <nda:segment nda:char="200">
          Friday November 3 4:35 PM ET
        MADRID (Reuters) <br/>
        </nda:segment>
        <nda:segment nda:char="50">
          Fishermen off northern Spain have captured a giant
          specimen of a strange, light-emitting, deep sea
          cephalopod, scientists said Friday.
        </nda:segment>
        <nda:segment nda:char="100">
          The octopus-like creature, a taningia danae, weighs in
          at 275 pounds, measures seven feet and is easily the
          biggest of its type discovered.  Disappointingly for
          big eaters near the Asturian port of Ribadesella it
          will not end up on their plates, but will be preserved
          and displayed in a marine center whose most impressive
          cephalopod to date was a mere 140 pound example.
        </nda:segment>
      </nda:area>

      <nda:area nda:concat="false">
        <nda:segment nda:char="50">
         <a href="picture50"> Picture </a>
        </nda:segment>
        <nda:segment nda:char="200">
         <a href="picture200"> Picture </a>
        </nda:segment>
      </nda:area>
    </p>
  </card>

</wml>
```

Fig. 6

FEATURES	VALUES
Color Capability	Boolean
Graphics	None, Low, Medium, High
Display Size	
Input System	Keypad, Keyboard, Stylus
Network Bandwidth	2G, 2.5G, 3G
(other Features)	(Values of Feature)
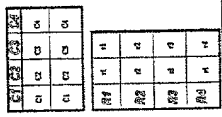
| Content-specific Forms of Feature	DVIML Elements	CONTENT EXAMPLE
X,Y	<nda:rigid>	
Aspect Ratio *Y, Y	<nda:shape>	
Columns *Char Width , Y	<nda:columns>	
X, Rows*Char Height	<nda:list>	Menu item 1 Menu item 2 Menu item 3 Menu item 4 Menu item 5 Menu item 6
X, $\frac{\text{Char Count}*\text{Char Height}}{\text{Columns}}$	<nda:area>	The feature utilization system proposed in Rosetta has two key ideas: the device is presented as an abstract device which has 'device-friendly' or 'author-friendly' features, shielding the author from brand-names and minor differences between devices. The content is classified into different types which are, on the other hand, 'device-friendly' These two key ideas are both aimed at making it easier to develop content for the multi device world of the present day.

FIG. 7

n Columns

Y

X

m Rows

181

FIG. 8

183

X_3 , Y_3

185

X_4 , Y_4

X_2 , Y_2

189

X_1 , Y_1

187
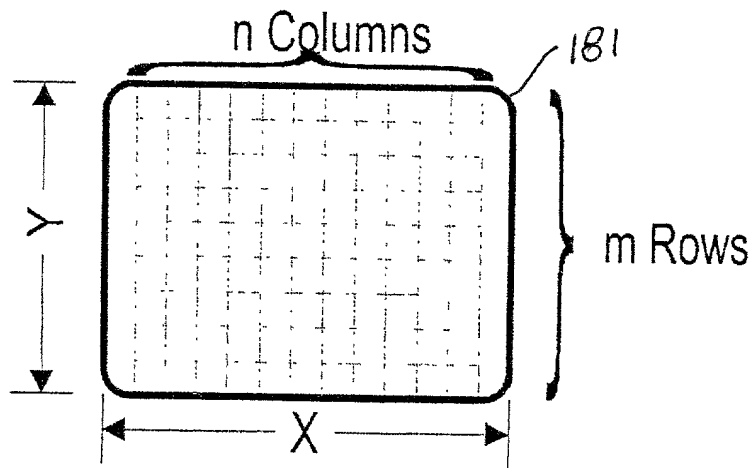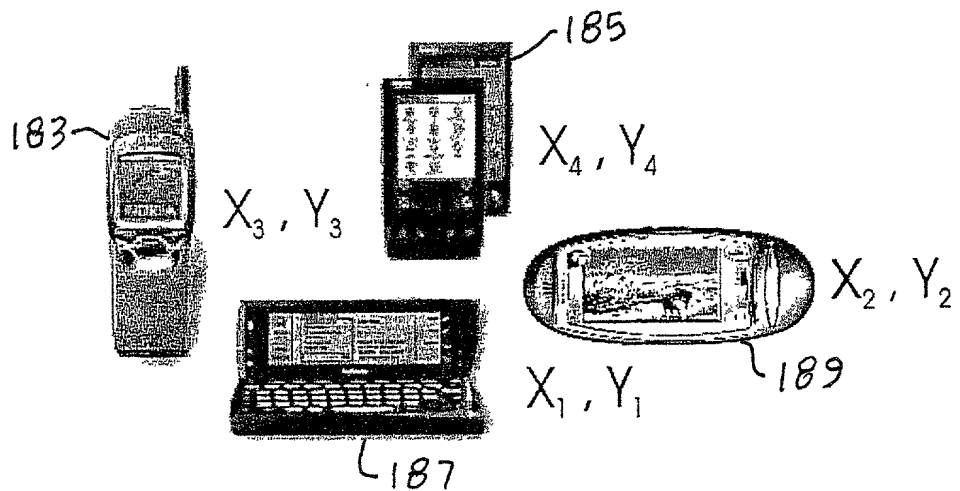
FIG. 9

Display Size DVIML Elements and Values

Content Characteristic	Relevant Device Display Attribute	DVIML Element	Value for Actual Device	Value for Generic Device
Images (Fixed Form)	X, Y	\<rigid\>	Zero to infinity and all integers in between (0 to ∞)	Same as for the actual device.
Tables and Vector Graphics (Generated Fixed Form)	ASPECT RATIO	\<shape\>	Zero to infinity and all numbers in between (0 to ∞)	SQUARE PORTRAIT LANDSCAPE
Columns (Y-Axis Free Form)	COLUMNS	\<columns\>	Zero to infinity and all integers in between (0 to ∞)	5 10 20+
Lists or Rows (X-Axis Free Form)	ROWS	\<list\>	Zero to infinity and all integers in between (0 to ∞)	5 10 20+
Text (Bi-axially Free Form)	CHAR COUNT	\<area\>	Zero to infinity and all integers in between (0 to ∞)	50 100 200+

FIG. 10

Device Profile for Palm Vx (illustrative only)

Feature	Polymorph	Value
	X, Y	160, 160
	ASPECT RATIO	SQUARE
Display Size	COLUMNS	20
	ROWS	20
	CHAR COUNT	200+
Graphics		YES
Color		NO
Keyboard Input		NO
Screen Input		YES

~193

FIG. 11

201

203a

Giant Deep-Sea
Creature
-Fishermen off
northern Spain have
Options   Back

205a

captured a giant
specimen of a strange
light-emitting deep
sea cephalopod.
Options   Back

207a

scientists said Friday.
Options   Back

212

WAPhoton

Giant Deep-Sea Creature Hmaz
Spanish scientist
Friday November 3 4:35 PM ET
MADRID (Reuters)
-Fishermen off northern Spain have
captured a giant specimen of a
strange light-emitting deep sea
cephalopod. Th...
changing scientists said Friday a
octopus like creature, a tentacle...
Back

213

215

FIG. 12

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.2.xml">
<wml xmlns:nda="http://nda.nokia.com/deviceAdapter" >
  <card id="Forecast" newcontext="true" title="Forecast">
    <p align="center">
      <nda:shape>
        <nda:pick nda:aspect_ratio="landscape">
          <table align="CCCCC" columns="5">
            <tr>
              <td>M</td>
              <td>T</td>
              <td>W</td>
              <td>Th</td>
              <td>S</td>
            </tr>
            <tr>
              <td><img alt="clouds"
src="../images/weather/clouds.wbmp"></img></td>
              <td><img alt="mixed"
src="../images/weather/mixed.wbmp"></img></td>
              <td><img alt="ptcloudy"
src="../images/weather/ptcloudy.wbmp"></img></td>
              <td><img alt="rain"
src="../images/weather/rain.wbmp"></img></td>
              <td><img alt="sun"
src="../images/weather/sun.wbmp"></img></td>
            </tr>
            <tr>
              <td>78 F</td>
              <td>89 F</td>
              <td>95 F</td>
              <td>88 F</td>
              <td>79 F</td>
            </tr>
            <tr>
              <td>68 F</td>
              <td>69 F</td>
              <td>75 F</td>
              <td>68 F</td>
              <td>65 F</td>
            </tr>
          </table>
```

Fig. 13A

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```
        </nda:pick>
45      <nda:pick nda:aspect_ratio="portrait">
         <table align="LCR"  columns="3">
          <tr>
           <td>M M</td>
           <td><img alt="clouds"
50     src="../images/weather/clouds.wbmp"></img></td>
             <td>Hi  78 F<br></br>Lo 68 F</td>
           </tr>
           <tr>
            <td>T</td>
55          <td><img alt="mixed"
     src="../images/weather/mixed.wbmp"></img></td>
             <td>Hi  89 F<br></br>Lo 69 F</td>
            </tr>
            <tr>
60           <td>W</td>
             <td><img alt="ptcloudy"
     src="../images/weather/ptcloudy.wbmp"></img></td>
             <td>Hi  95 F<br></br>Lo 75 F</td>
            </tr>
65          <tr>
             <td>Th</td>
             <td><img alt="rain"
     src="../images/weather/rain.wbmp"></img></td>
             <td>Hi  88 F<br></br>Lo 68 F</td>
70          </tr>
            <tr>
             <td>S</td>
             <td><img alt="sun"
     src="../images/weather/sun.wbmp"></img></td>
75           <td>Hi  79 F<br></br>Lo 65 F</td>
            </tr>
           </table>
          </nda:pick>
         </nda:shape>
80      </p>
       </card>
      </wml>
```
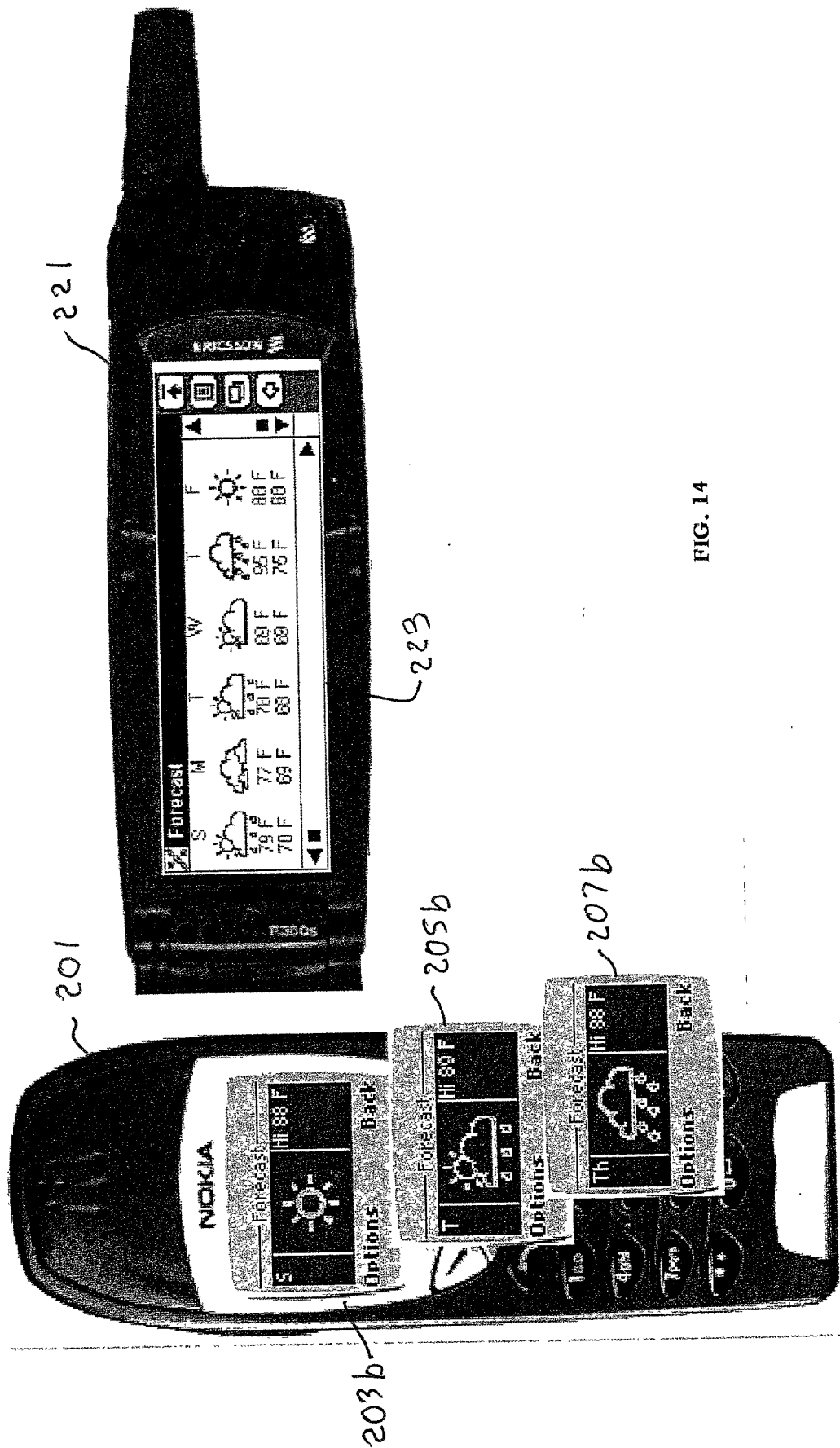
Fig. 13B

FIG. 14

Consider an object which has
four features.

Features = α β χ δ

FIG. 15

Each Feature may take
different values, denoted by
a different 'font' here.

α β χ δ
A B C D
A B C D
A B C D
A B C D
A B C D
A B C D

FIG. 16

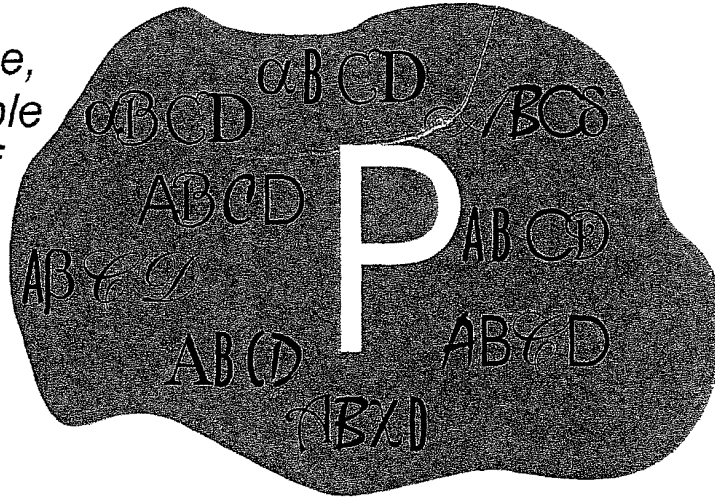*These 'features' describe a space, where all possible combinations of values exist.*
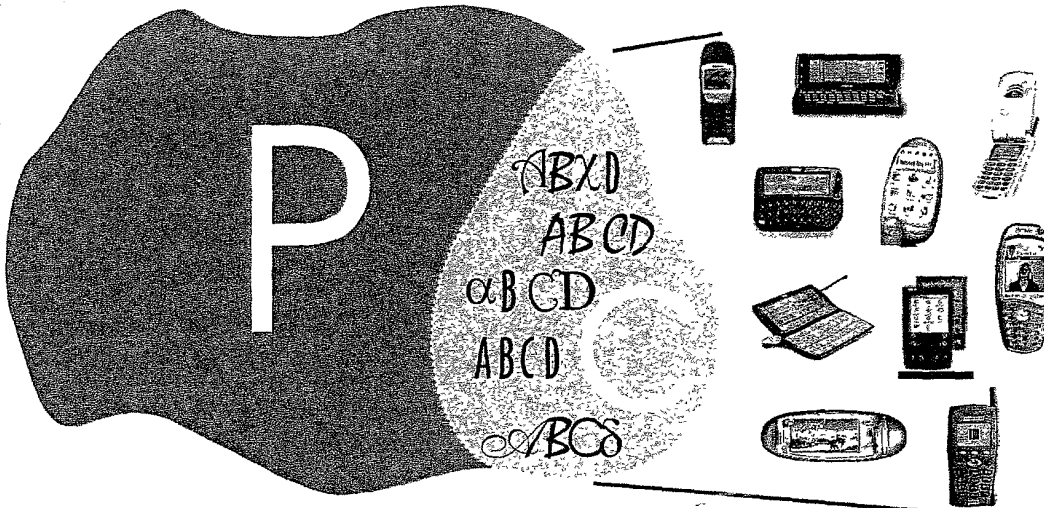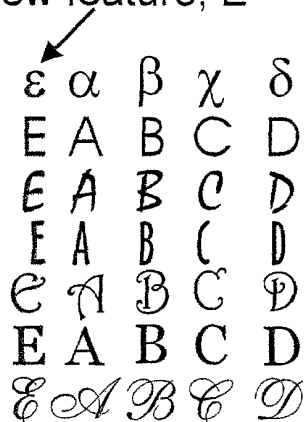
FIG. 17

FIG. 18

New feature, E

New Features extend the 'space'. Until we extend our 'alphabet' we do not recognize this space.

ε α β χ δ
E A B C D
E A B C D
E A B C D
E A B C D
E A B C D
E A B C D

FIG. 19

Converged feature, D

Old features may converge to a single value, and hence no longer be of interest.

ε α β χ d
E A B C D
E A B C D
E A B C D
E A B C D
E A B C D
E A B C D

FIG. 20

FIG. 21